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FUSARIAL WILT OF CUCURBITS

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Wilt of cucurbits (causative agent -- Fusarium oxysporum Schlecht.) occurs to a greater or less extent every year in the zone where these crops are grown, and causes appreciable damage.

The disease manifests itself during the period of emergence of the seedlings as well as at the time of blossoming and fruit formation. When the seedlings are affected there occurs, as a rule, a decaying of the roots, in the form of a "black shank", and the formation of strictures at the root collar. A white coating of the fungus is often formed over the affected parts. During the period of blossoming and fruit formation the disease develops gradually and manifests itself at first by a wilting of some of the vines; on the latter are frequently formed brown spots, on which is sometimes seen a pinkish-white coating of the fungus. The disease causes a stunting of the plants, which usually results in the formation of undersized fruit.

The wilt is encountered most often on melons, watermelons and cucumbers, less frequently on pumpkins.

Thus, in the Uzbek SSR, up to 25% of the melon vines are frequently killed by the disease (I. S. Mirpulatova, 1951). In the other districts of Central Asia, cases of widespread infection of all the vines have been reported (Ye. V. Gerbanevskaya, 1958, 1959). In the Azerbaydzhan SSR (U. A. Ragimov, 1958) fusarial wilt has been found on melons (30-50%), watermelons (16%) and cucumbers (19%). In the Ukraine and in Moldavia the disease is widespread on watermelons and melons everywhere, and is considered very harmful (V. I. Timchenko, 1963) since it often kills from 5 to 86% of the vines

(N. A. Nikiforova, 1964). The disease has been found on cucurbits in Armenia (D. N. Teterevnikova-Babayan, 1959), in Georgia, the Lower Volga region and in the Kazakh SSR (M. N. Badigin, 1931, 1935). In 1963 a very severe infection of watermelons (up to 60%) was recorded in the Saratovskaya and Poltavskaya oblasts.

On cucumbers this disease has been observed (extensively) within the Volga region (M. G. Alimbekov, 1940) and in the Far East (A. F. Sal'nikova, 1953). In 1963, at some of the greenhouse-crop farms of the Chelyabinsk Oblast the cucumbers were infected to the extent of 50-60%; all the infected plants perished.

The causative agents of this disease -- the F. oxysporium fungus and its specialized forms -- can cause the wilting of a number of farm crops. On studying the specialized forms of the fungus of this species, isolated from the wilt-infected melon-, watermelon- and cucumber-plants, we have found that they are not of a narrow specialization. The isolates of this fungus obtained from different plant species were found to be most pathogenic in relation to the initial plants, but have the power of infecting, to a varying extent, also other crops (flax, tomatoes, alfalfa, peas, etc.). Thus, the process of differentiation of this species into specialized forms is evidently in the development stage, and a narrow specialization of the fungus forms is not yet observed.

For a correct identification of the causative agents of the wilt, they must be isolated in the form of a pure culture, by following the "Procedural Directions on Diagnosis of Fusarial Diseases of Annual Leguminous Plants" (VIZR, 1963).

Thus, on segregation of isolates of the fungus from watermelon, melon, or cucumber, as a pure culture (on wort agar), the latter showed almost no distinguishing morphological-cultivation characteristics. Their mycelium colonies are pellicular-fluffy, white with a purplish tinge as a rule, except for a strain derived from a melon (in Central Asia) which shows yellow shades of mycelium coloration, while its stroma is crimson-purple (frequently of a vivid color). These isolates are characterized by a copious formation of the oval, colorless microconidia, and a scanty one -- of the slightly curved, colorless macroconidia; the latter are mostly with three dividing walls, of the same diameter over the entire length, have a pointed upper cell and a pedicle at the base. They measure 21.7-37.2 x 3.1-4.6 microns.

For a determination of species of the Fusarium genus it is recommended to follow the procedure of V. I. Bilay (1955).

In spite of the widespread occurrence and the very harmful nature of the fusarial wilt of cucurbits within certain zones of their growing range, an inadequate amount of attention is being given to this disease. Data are not being received regularly from the Forecast Service observation posts, and by no means fully reflect the actual situation.

This hinders the conduct of surveys, and to an even greater extent the development of methods for the forecasting of the development of these diseases.